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Noxious Times

a quarterly publication of the California Interagency Noxious Weed Coordinating Committee

In this issue...

Lassen County California's *Big Valley Pest Abatement District*:

A Special District Funding Noxious Weed Control Through Property Tax Assessment - BY: Lynne M. Turner, Lassen County Agricultural Biologist, Susanville California

Tucked away in the northwest corner of beautiful Lassen County is a region known as Big Valley. Big Valley encompasses several small towns including Little Valley, Pitville, Nubieber, Bieber. This area has been, historically and presently, a vast expanse of agricultural land being farmed and grazed. The citizens who comprise the population of this area are committed to maintaining a healthy ecosystem and agriculturally productive lands. Their collective concern back in the mid 1940s is the beginning of a story of responsibility and dedication.

It's May, 1943. Concerned farmers of the Big Valley Area of Lassen County are alarmed by the occurrences of noxious weed infestations. They, accompanied by a representative of the state board of Agriculture, Mr. Walter Ball, conduct a series of field inspections. The conclusion was that hoary cress, Russian knapweed, and yellow starthistle infestations were requiring more *continued on page 4...*

SENATE BILL 1573
AQUATIC NUSIANCE SPECIES COUNCIL

(Summarized by Susan Monheit, CDFA-IPC)

Senator Karnette (D), et al, sponsored Senate Bill 1573 to establish an Interagency Aquatic Invasive Species Council (the Council) to develop a comprehensive approach to the management of aquatic invasive species. The Department of Fish and Game (DFG) will take the lead in developing a comprehensive plan to manage invasive aquatic species, and the Council will oversee their progress at its biannually meetings.

Furthermore, the Council is authorized to develop protocols to be followed in responding to infestations not listed for control or eradication in any current statute or regulation. It will review and comment on proposals for new or amended management plans, review any proposed site-specific regulations, and serve as a clearinghouse for information.

Senator Karnette was concerned that California was spending million of dollars trying to control invasive species in the state, but without a fully coordinated approach. The Associated Press printed an article on September 2, 2002 reporting that $4 million has already been spent by state and federal groups trying to *continued on page 3..*

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Chairman's Message: Steve Schoenig

Hard Times -

The current economic crisis in California has presented a great challenge to maintaining and expanding our efforts in weed control throughout the state. We are experiencing cutbacks, a hiring moratorium, spending and travel restrictions at the state level. Federal and local county budgets are experiencing their own belt tightening. It is hard to see monetary resources drying up while public interest and desire to stop weeds damage is increasing. I can already see project managers and weed groups becoming more creative in finding outside funding and ways to make current funding go farther. The Noxious Times will endeavor to seek out and publish information on novel sources of funding. We will also report on efforts to obtain new funding programs at the state and national level.

Glyphosate risk analysis -

In this issue of the Noxious Times we have included a condensed version of an ecological risk-assessment for the active ingredient Glyphosate. This document was put together as part of the environmental compliance package for CDFA's Purple Loosestrife Control and Coordination Project. It is being printed to share what we found in the literature and through consulting with experts. This resurrects an early goal of CINWCC - which was for agencies and managers to share environmental compliance information - thus preventing the continual need for reinvention of the wheel. ❖

Noxious Times is a publication of the California Interagency Noxious Weed Coordinating Committee. The committee was formed in 1995 when 14 federal, state, and county agencies came together under a Memorandum of Understanding to coordinate the management of noxious weeds. The committee's mission is to facilitate, promote, and coordinate the establishment of an Integrated Pest Management partnership between public and private land managers toward the eradication and control of noxious weeds on federal and state lands and on private lands adjacent to public lands.

The *Noxious Times* newsletter intends to help the committee achieve its goals of coordination and exchange of information by providing land managers throughout the state with information on weed control efforts, news, and successes.

Noxious Times is published quarterly by staff of the Integrated Pest Control Branch at the California Department of Food and Agriculture. We welcome submissions for our upcoming issues. Please send to: CA Department of Food and Agriculture, ATTN: Noxious Times, 1220 N Street, Room A-357, Sacramento, CA 95814 or e-mail: noxtimes@cdfa.ca.gov

If you have a colleague whose name you would like to add to our mailing list, please send mailing information to the address above.

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...SB 1573 continued from page 1

eradicate *Caulerpa taxifolia* from two locations on California's coast. Since these efforts have not completely eradicated *Caulerpa taxifolia*, more money is likely to be needed in the future. The economic and environmental problems related to aquatic invasive species will only get more severe with time.

A comprehensive plan will help the state address invasive aquatic species more effectively and efficiently. Currently, in California, invasive species are being dealt with on an individual, piecemeal process even though many aquatic species have large similarities in management needs. Management approaches, especially for prevention, often work for more than one aquatic species and do not need to be devised separately for each species or each agency.

Preventing the introduction of just one invasive aquatic species has the potential to save California millions of dollars. Furthermore, if the comprehensive plan is approved by the National Aquatic Nuisance Species Task Force, California will be eligible for Federal assistance for up to 75% of the implementation costs of the plan.

The council creates a formal structure to assure that the agencies are communicating and coordinating their efforts. Additionally, the council will create a forum for the agencies and public representatives to pool their resources and knowledge, which can then be shared with other agencies, the legislature, and the public.

Several other states have established comprehensive plans, including Minnesota and Washington. In Minnesota, a coordinated approach between their state agencies has proved to be particularly important in prevention efforts. Studies by the Minnesota Sea Grant program have shown that boaters are more likely to perform precautions to minimize the risk of spreading of aquatic invasive species if they are given consistent information. An interagency

continued on page 15...

Model Weed Control Ordinance

A Tool for Agricultural Commissioners

A new tool is available to California county agricultural commissioners trying to control the sale and distribution of invasive species on a local level. If a commissioner feels that an invasive species poses a threat, and that species is not on the state's list of noxious weeds under quarantine, he or she may request that a local ordinance be drafted to control and exclude that species. The Secretary of the Dept of Food and Agriculture must approve such an ordinance. Now there is a model available to county commissioners outlining the necessary information for this request.

The ordinance would restrict the non-native plants stated in the proposal from sale or movement into the county. The ordinance, however, does not restrict the movements of these plants trough the county.

Although county commissioners were always able propose ordinance for the control of invasive species, the model now makes the process easier to apply for and also process. By creating this more uniform document, any ordinance proposed will be more quickly processed. Contact your agricultural commissioner for more information. ❖

Update: California's Weed Free Forage Program *By Stephanie Balsdon*

California is in the process of developing a program in response to the United States Forest Service (USFS) and Bureau of Land Management (BLM) land closure orders; it is one of several initiatives to control the introduction and spread of noxious weeds on many public lands throughout the state.

By the end of 2003, the USFS and BLM hope to require the use of certified noxious weed free forage and mulch on many of their lands. The US National Park Service intends to follow suit at a later date. Complete program implementation is expected to follow April 1, 2004. A recently launched education initiative is expected to be ongoing.

The California Agricultural Commissioner's and Sealers Association (CACASA), CDFA and the USFS held a meeting in December 2002 to discuss the certification process. It was agreed that participating County Agricultural Commissioners will follow existing standard inspection procedures currently used by the USDA and the California Department of Food and Agriculture (CDFA). These inspections can be performed both pre- and post-harvest and will be documented by a certification slip. A copy of the original certification slip must accompany feed and forage being brought onto public lands.

There are Stakeholder Meetings available to the public, scheduled periodically, to further inform the public about the program, answer questions and address concerns. For additional information, please contact Karl Bishop (plusieag@inreach.com) or Cheri Rohrer (crohrer@fs.fed.us). ❖

... Big Valley, continued from page 1

aggressive control measures. Puncturevine and squarrose knapweed eventually became weeds of concern as well.

On June 15, 1943, through word of mouth and telephone calls to neighbors, a town meeting was held to address one concern; noxious weed control. A presentation was made to the community, and as historical records indicate, 36 farmers were in attendance. The meeting concluded with the appointment of a committee who's goal would be to petition for the forming of a special pest abatement district in order to contain and eradicate noxious weeds.

In 1944, the Big Valley Pest Abatement District was formed. The BVPAD is a special district under a board of five local governing members. A property tax assessment based on valuation is the source of revenue, and the average annual budget was $4,000.00. That money would be spent on chemicals, salaries, and equipment needed in order to treat weeds for the entire district. The district covered approximately 260,000 acres.

The district began operating in 1947 with its own 150 gallon sprayer and borrowed county equipment. The board assembled on a monthly basis during the spray season to discuss issues which kept things operating such as bills needing paid, chemicals to be purchased, any repairs which were needed on spray equipment, and the salaries of spray crew personnel. New chemicals, methods of applications, and their effectiveness were also topics of past meetings minutes. On occasion, trials were conducted by the farm advisor to monitor efficiency of treatments and innovativeness of new products.

In the present day, the District's average annual budget is roughly $12,000.00. This money serves as funding for the purchase of chemicals and the ongoing helicopter program. The Lassen/ Shasta County Farm Advisor, California Department of Food and Agriculture and the Lassen County Agricultural Commissioner provide support to the district and its mission of weed control with labor, equipment, and weed control recommendations. Farm Advisors and County and State Biologists work with the District on prioritizing needs and conducting test plots. The district continues to supply the chemical needed to combat noxious weed infestations.

The District's target weed pests are Scotch thistle, squarrose knapweed, yellow starthistle, and Russian knapweed. Through the employment of ground treatment and aerial applications, noxious weed infestations are treated annually. The average ground spray season runs from May through September of each year. The spray crew consists of two members working for the county on a seasonal, full time basis. Additionally, the district supplies chemical to the growers and farmers within, and who obtain the proper materials permit. This service is provided in order to promote a team effort between individual landowners and county spray personnel.

After 60 years of combating weeds, the members of the Big Valley Pest Abatement District are still committed to noxious weed management. They understand the detrimental potential effects of weed invasions and do their part by monitoring, reporting, and even treating their own noxious weeds. ❖

For more information about the Lassen County BVPAD, contact Lynne Turner at, lassenag@psln.com

Glyphosate-Based Aquatic Herbicides An Overview of Risk

By Susan Monheit, CDFA-IPC

<Editor's note - The following article is the result of a thorough literature review and multiple consultations with pesticide chemists and eco-toxicologists. It does not constitute an endorsement for any commercial product. The noxious times staff is aware that many of the issues around the safety of Glyphosate-based herbicides concern surfactants rather than the active ingredient. A similar review is being conducted on surfactants and will be presented in a future Noxious Times. Persons wishing to obtain a electronic copy of this article may email loosestrife@cdfa.ca.gov .>

Public awareness of the potential adverse effects of pesticide use has been growing over the past several decades. Environmentalists now raise concerns when pesticides are used, and demand proactive assessments of the potential impacts of pest management activities. What has not been widely recognized by many environmentalists is the magnitude of difference between highly toxic, persistent, and lipophillic (fat soluble) organochlorine insecticides such as DDT, and the relatively low toxicity, quick degradability, and lipophobic (fat insoluble) nature of glyphosate-based herbicides such as Aquamaster® (Monsanto Company, St. Louis MO), Rodeo® (Dow Agrosciences, Indianapolis, IN), and Roundup ® (Monsanto Company, St. Louis MO).

Integrated pest management (IPM) is a multi-disciplinary approach to tackling the problem of invasive species. In integrated weed management programs, effective tools to control the spread of noxious weeds may include mechanical, chemical and biological control techniques. Each method has its strength, and when used together or in succession, can increase the effectiveness of a program substantially. The use of herbicides to control noxious weeds is an integral part of this process. Efficacy and potential toxicity to non-target organisms are the two factors that most often the guiding herbicide selection. When used with discretion, and a carefully selected surfactant, glyphosate-based herbicides can offer a highly effective option, with relatively little adverse effect.

In this paper, current risk assessments, bioassay toxicity tests, and other studies performed on glyphosate or glyphosate-based herbicides, are reviewed. In a follow-up article, surfactant toxicity will be addressed. Together, these articles are intended to establish a basis for confidence in the use of glyphosate-based herbicides as an environmentally sound technique for the management of noxious invasive aquatic plant species.

Risk values and toxicity data for the herbicide Roundup® (labeled only for terrestrial uses) are included because most available literature on glyphosate-based herbicides examined Roundup® formulations rather than the aquatic labeled products Rodeo® or Aquamaster®. The formulations of Aquamaster® and Rodeo® differ from Roundup® herbicide in that they have a higher concentration of the active ingredient, glyphosate, but contain no surfactant.

How Glyphosate-based Herbicides Work

There are many formulations of glyphosate-based herbicides, many of which have the same basic ingredients: isopropyl amine (IPA) salt of glyphosate, water and some type of surfactant (specific surfactants are chosen by the herbicide products' manufacturer, or are added after market by the consumer). The exact formulation of Aquamaster®/Rodeo® is isopropylamine (IPA) salt of glyphosate (53.5%), water (46.5%). A surfactant must be added to these products before application to enable glyphosate to penetrate cuticular waxes and allow uptake by plants. The formulation of Roundup® is isopropylamine (IPA) salt of glyphosate (480 g/L), water and ethoxylated tallow amine surfactant, POEA.

Aquamaster®/Rodeo® herbicide, once mixed with a surfactant, is generally applied by direct spray to foliage. Glyphosate is assimilated by leaves and other green plant tissue, and is then rapidly translocated within the phloem throughout the entire plant including its roots. Glyphosate's mode of action is to prevent a plant from producing the essential amino acids tryptophan, tyrosine, and phenylalanine, which reduces the production of protein within the plant, thereby inhibiting plant growth (Herbicide Handbook, 1994; Glyphosate Pesticide Fact Sheet, USDA; Williams et al 2000). The biochemical (protein production) pathway by which glyphosate acts on plants is not found in animals. This helps explains the low risk to animal species from labeled uses of glyphosate.

Glyphosate

Glyphosate-based herbicides are among the most widely used broad-spectrum herbicides in the world because they are highly efficacious, cost effective, practically non-toxic, and degrade readily in the environment. Glyphosate is soluble in water, and tends to bind tightly to sediment, suspended particulates, organic matter and soil, becoming essentially unavailable to plants or other aquatic organisms. Glyphosate

[1] Aquamaster and Rodeo are trademarks of Monsanto Company and DowAgrosciences, respectively.

does not bioaccumulate, in terrestrial or aquatic animals (Giesy et al. 2000; Williams et al 2000). Herbicidal effects are therefore limited to foliar contact, cut stump or stem injected applications on plants. Glyphosate rapidly dissipates from surface waters, and soil microflora quickly biodegrade glyphosate into AMPA and CO_2 (Gardner & Grue 1996). AMPA also undergoes rapid degradation to CO_2 in soil (Rueppel et al 1977).

Formulations of glyphosate including Rodeo®, Roundup®, and Aquamaster® have been extensively investigated for their potential to produce adverse effects in non-target organisms. Governmental regulatory agencies, international organizations, and others have reviewed and assessed the available scientific data for glyphosate formulations and independently judged them to be of minimal risk to the environment (Agriculture Canada 1991; USEPA 1993; WHO 1994).

Since glyphosate's development in the 1970's, there have been no documented cases of adverse effects on fish or aquatic invertebrates associated its use for the control of aquatic weeds (Giesy et al. 2000). Several field studies have investigated effects of aquatic weed control applications on aquatic animals (Solberg and Higgins 1993; Findlay and Jones 1996; Simenstad et al. 1996; Linz et al 1997). No measurable increases in effects on density, abundance, or survival of aquatic invertebrates have been reported from the direct effects of glyphosate in field studies (Haag 1986; Henry et al. 1991; Gardner & Grue 1996; Simenstad et al. 1996; Linz et al. 1999).

Pesticide Registration

"A pesticide product may be sold or distributed in the United States only if it is registered or exempt from registration under the Federal Insecticide, Fungicide and Rodneticide Act (FIFRA). Before a product can be registered unconditionally, it must be shown that it can be used without causing any unreasonable risk to man or the environment." (USEPA 1993c). Periodically, pesticides and their active ingredients undergo re-registration. As part of the re-registration process of pesticide active ingredients, new toxicity studies and risk assessments are reviewed. Glyphosate was re-registered by the EPA in 1993 (USEPA 1993d).

Ecological Risk

Risk is an assessment of the potential for adverse effects that result from some activity. Practically anything however, can be toxic if the dose or level of exposure is high enough. Toxicity alone does not indicate risk. This concept was first elaborated by Paracelsus (1492-1541), who said "What is there that is not poison?" In other words, the dose makes the poison.

To assess the potential effects of a known chemical to wildlife, exposure (average daily dose - ADD) is compared to some conservative reference dose of known toxicity (toxicity reference value -TRV). Together ADD/TRV give a hazard quotient (HQ), which is a measure of risk. If calculated HQ's are less than 1, no adverse effects are expected from the defined exposure. If HQ's are greater than 1, either more site-specific information is needed, or adverse effects are indicated.

Several toxicity values derived from laboratory tests can be used as TRV's. An LC_{50} is a toxicity value that indicates a concentration at which 50% of the test organisms will die (lethal concentration). A no-observable-effects-level (NOEL), and lowest effects level (LEL) are other commonly used TRV's.

Toxicological Effects

Numerous tests to study the toxicity of glyphosate herbicides have been conducted on rodents, dogs, rabbits, birds, fish, aquatic invertebrates and aquatic vegetation. These tests show that glyphosate, while highly toxic to plants, is largely non-toxic to other animals (Williams et al 2000).

In wildlife assessments, aquatic toxicity values are derived from bioassay tests. Avian and mammalian toxicity values are derived from field sampling studies. Toxicity to humans however, is extrapolated from carefully controlled studies using laboratory animals. Little direct toxicity data exist for human exposure to glyphosate. The California Department of Pesticide Regulation (DPR) maintains the few anecdotal or physician reported records that exist for human adverse health effects as a result of exposure to glyphosate-based herbicides.

Aquatic Toxicity: In aquatic bioassays tests, test organisms are

Table 1. Toxicity Classification For Aquatic and Avian Species (Giesy et al. 2000)

U.S. EPA Toxicity Classifications[a]	European Toxicity Classification[b] (Aquatic)	Acute aquatic LC_{50} or EC_{50} (mg/L)	Avian dietary LC_{50} (mg/kg)
Practically nontoxic	—	>10	>5000
Slightly toxic	Harmful	>10, ≤100	>1000, ≤5000
Moderately toxic	Toxic	>1, ≤10	>500, ≤1000
Highly toxic	Very toxic	≥0.1, ≤1	>50, ≤500

exposed to a range of contaminant concentrations over time. When 50% of the test organisms die, the test is stopped, and an LC_{50} (lethal concentration) or LD_{50} (lethal dose) is calculated. The smaller the amount of chemical required to kill 50% of the test organisms, the more toxic the chemical is. A highly toxic compound might have an LC_{50} between 0.1 and 1 mg/kg for aquatic animals, and 50 to 500 mg/kg for birds (See the Table 1). Glyphosate is only slightly toxic to wild birds, and practically non-toxic to fish. LC_{50} values for both mallards and bobwhite quail are greater than 4,500 ppm (Forest Service 1984, Giesy et al. 2000).

To put these toxicity values in context, it is valuable to compare receptor toxicity response with concentrations of glyphosate found in water and sediment after direct application of formulated herbicide. A review of current literature showed environmental glyphosate concentrations after herbicide application to range between 0.090-1.700 mg/L in ponds, 0.020-1.237 mg/L in streams, 0.162-1.0 mg/L in surface waters, and 0.11-2.82 mg/kg in a variety of sediments (Giesy et al. 2000). Aquatic organisms would need to be exposed to concentrations of glyphosate 100 times greater than that which is present after ordinary (following label instructions) use around streams, and 60 times greater than is present after ordinary use around ponds to show toxic effects. The same holds true for glyphosate-bound sediments – birds would have to consume incredibly large amounts of sediment to reach the level of glyphosate consumption that caused adverse health effects in test animals.

The acute LC_{50} values for fish exposed to Roundup® (a glyphosate-based formulation with POEA surfactant), glyphosate IPA salt, the metabolite AMPA, and the surfactant POEA, are listed in Table 2. Comparison of these values clearly shows that the surfactant POEA, and the Roundup formulation (with surfactant included), are more toxic than glyphosate itself. In acute toxicity studies with amphibians, glyphosate was found to be practically nontoxic to slightly toxic, while Roundup® was slightly to moderately toxic (Giesy et al. 2000).

Table 2. LC_{50} Values for fish exposed to components of the herbicide Roundup.

Test Compound	Test Species	LC_{50} Values (mg/L)
Roundup®	Rainbow trout	8.2 (NOEL: 6.4 mg/L)
Glyphosate	Rainbow trout	140-240
AMPA	Rainbow trout	520 mg/L
POEA	Rainbow Trout	0.65-7.4

(Giesy et al. 2000)

Mammalian Toxicological Data: In toxicological studies performed with mammals, the test animal is dosed with a specific amount of material, and observed in a laboratory for a variety of acute and chronic effects. LC_{50} values measure acute effects (death). Chronic evaluations include assessments of overall health, behavior, biochemical/physiological processes, and focused evaluations for reproductive toxicity, teratogenicity, and carcinogenicity. Toxicity evaluation endpoints include survival, growth, reproduction, cancer and teratogenic abnormalities (birth defects).

Glyphosate is poorly absorbed by the digestive tract in mammals, and is excreted essentially unmetabolized (Williams et al 2000; EXTOXNET database, Cornell Univ). This is reflected by the large amount of glyphosate needed to cause acute toxicity (death) in test animals. The acute oral LD_{50} value for glyphosate in rats is greater than 5000 mg/kg (WHO, 1994), and 8300 mg/kg for AMPA (Williams et al 2002: Birch 1973). Other oral LD_{50} values for glyphosate are 1,538 mg/kg to greater than 10,000 mg/kg for mice, rabbits, and goats (Extoxnet database, University of Cornell; National Library of Medicine 1992; Williams et al 2000). Toxicological data for Rodeo® specifically include: Oral LD_{50} rat >5000 mg/kg; Dermal LD_{50} rabbit >5000 mg/kg; 4-h Inhalation LC_{50} rat >1.3 mg/L; Skin irritation rabbit, none; Skin sensitivity in guinea pig, none; Eye irritation in rabbit, none (Herbicide Handbook 1994).

The USEPA made the determination in its re-registration eligibility decision (RED), that glyphosate is not carcinogenic to humans based on a large body of data from tests performed with laboratory animals (USEPA 1993a). Subchronic and chronic toxicity studies performed with rats, dogs, mice and rabbits ranging from 21 days to two years, and diet concentrations of 3125 ppm to 50,000 ppm (Williams et al 2000: NPT 1992) revealed few treatment-related changes, and the effects observed were confined to the highest doses tested (US EPA RED, 1993).

New chronic rat and two generation rat reproduction studies were submitted as part of the re-registration process for glyphosate. These studies showed no adverse histological consequences on any reproductive or endocrine tissue from either male or female rats even at exaggerated dosage levels (Williams et al 2000).

The U.S. EPA bases its risk assessment for humans on the lowest NOAEL recorded in the various studies. The NOEL for glyphosate, 175 mg/kg/day, comes from a rabbit

teratology study. In human health evaluations for glyphosate, the reference does (RfD) has been set at 1.75 mg/kg/day (175 mg/kg/day NOAEL divided by the uncertainty factor of 100X = 1.75 mg/kg/day).

Neurotoxicity, Immunotoxicity and Endocrine Disruption.

In a recent risk report commissioned by the USFS (SERA 1996) on three commonly used herbicides, the potential for glyphosate to cause neurotoxicity, immunotoxicity and endocrine disruption was evaluated. No evidence was found to support glyphosate as a neurotoxicant, immunotoxicant or endocrine disruptor (SERA 2002). SERA found no evidence that glyphosate is a direct neurotoxicant in humans or other species. Several long-term experimental studies of dogs, mice and rats did not find evidence of neurotoxicity to the brain. Nor was there any evidence of neurological effects found among forest workers who mixed and sprayed Roundup® in a small clinical investigation of worker exposure.

Glyphosate does not appear to be an immunotoxicant in humans or other animals, based on results from the available studies in humans and experimental studies in rodents. "This conclusion is supported not only by an extensive set of standard mammalian bioassays on toxicity, but also by an *in vivo* assay specifically designed to detect humoral immune response, and an *in vitro* assay specifically designed to detect cell mediated immune response" (SERA 2002).

Three specific tests on the potential effects of glyphosate on the endocrine system were conducted. No effects were reported in any of the tests. "The conclusion that glyphosate is not an endocrine disruptor is reinforced by epidemiological studies that have examined relationships between occupational farm exposures to glyphosate formulations and risk of spontaneous miscarriage, fecundity, sperm quality and serum reproductive hormone concentrations" (SERA 2002). None of these studies have found positive associations between exposure to glyphosate formulations and any reproductive or endocrine outcomes.

Application Studies Using Rodeo®/ Aquamaster® and Roundup®

Giesy et al 2000: In the "Ecotoxicological Risk Assessment for Roundup® Herbicide" (Giesy et al. 2000) Roundup®, glyphosate, and the surfactant POEA where subjected to current ecological risk assessment methodology to provide an index of environmental safety. "Worst-case" assumptions, and NOELs from the most sensitive test species were used to calculate very conservative HQ's.

The results of the acute risk assessment for Roundup® showed minimal risk (HQ's < 1.0) for all aquatic taxa (microorganisms, aquatic macrophytes, fresh-water invertebrates, fish, and amphibians) in environments 2-meters deep. In shallow water (0.15 meters), acute hazard values approached, or in some instances exceeded, minimal risk levels (HQ's > 1.0) warranting further investigation. An examination of risk assessment assumptions revealed that herbicide degradation, sorption, and interception by target vegetation of greater than 50% would mitigate the potential for effects in shallow waters (i.e.: bringing the HQ values back below 1.0).

Evaluations of chronic risk looked at the components and metabolites of Roundup® independently. Chronic risk evaluations indicated minimal risk for all components and metabolites, even in shallow waters. While Roundup is not registered for aquatic use, Giesy et al. (2000) concluded that the use of Roundup® for aquatic habitat restoration can be safely carried out, but requires consideration of items such as application rate, depth of water and percent vegetation coverage.

Trumbo 2000: In an assessment of the non-target aquatic impacts of the herbicide Rodeo® and the nonylphenol ethoxylate surfactant R-11®, chemical analysis from two of three sites yielded no herbicidal or surfactant constituents, and no toxic effects. Water chemistry from a third site (a still water pond) showed a statistically significant mortality of 30%, and the presence of surfactant constituents in water analysis. This study will be discussed in greater detail in a subsequent article addressing surfactant toxicity.

Gardner & Grue 1996: Results of a series of laboratory and in-situ bioassay test performed on water from wetlands in Washington State treated with Rodeo® show that the herbicide did not pose a hazard to aquatic invertebrates or fish. The same study however, showed reduced growth of duckweed 48 hours after exposure to Rodeo® (Gardner & Grue 1996). Based on their findings, the authors of this study concluded that Rodeo® might pose a greater hazard to non-target aquatic vegetation than to other aquatic organisms. (The surfactant used was not identified).

Simenstad et al 1996: In another study, benthic invertebrate response to the use of Rodeo® and X-77 Spreader® (NPEO surfactant) to control smooth cordgrass *(Spartina alterniflora)* was undetectable. Neither short-term (28-d) or long-term (119-d), population effects were observed following the use of the herbicide/surfactant mix (Simenstad et al 1996).

Surfactants

To effectively control weeds, a surfactant must be added to Rodeo®/ Aquamaster® before application. This allows the user to select a surfactant that meets the specific needs of the weed control program. Efficacy and potential toxicity to non-target aquatic

organisms are the two factors that most often guide surfactant selection.

While there is a plethora of data available on the relatively non-toxic effects of glyphosate, the active herbicidal ingredient in Rodeo®/ Aquamaster®, and Roundup®, there is a dearth of information regarding the toxicity of adjuvants (surfactants) which must be added to activate herbicides designated for aquatic use.

On the whole, available toxicity data for surfactants indicate that they are more toxic than glyphosate. Surfactant toxicity data will be presented in a subsequent Noxious Times article, and the choices available to resource conservation/weed control program managers will be discussed. One thing is clear, there is little information published on this subject, and more studies of surfactant toxicity are needed to fill the data gap.

Secondary effects

The creation of open water habitat in wetlands through the use of herbicides such as Rodeo®/ Aquamaster®, create trade-offs for wildlife populations. Studies have noted an increase in populations of some aquatic invertebrates, and species of birds following treatment of cattail-choked-wetlands with Rodeo® (Linz et al. 1999; Baltezore, Leitch & Linz 1994). Rails, shorebirds and waterfowl will increase when vegetation is thinned, while numbers of red-winged blackbirds, wrens, upland game, furbearers and deer may decline (Baltezore, Leitch & Linz 1994). In some cases, short-term declines in populations may be anticipated because of changes in habitat (i.e.: temporary diminishment of food sources, and nesting or shelter sites). Therefore, ecological assessment endpoints of any habitat rehabilitation program, needs to reflect the long-term goals of the program.

Summary

A review of key documents and studies assessing the acute and chronic toxicity, neurotoxicity, immunotoxicity, and endocrine disruption risks of glyphosate-based herbicides, indicates that non-target organisms are exposed to minimal risk through the use of these herbicides. The surfactants used in the formulation of glyphosate-based herbicides, or mixed with the aquatic herbicides Aquamaster® and Rodeo® before application, are far more acutely toxic than the active ingredient itself. A well-administered management program for the control of noxious weeds can minimize potential exposure and risk to non-target organisms through use of BMPs. Application rate, depth of water, water movement and mixing, and percent vegetation converge are key factors in minimizing unwanted aquatic exposures. Surfactants of low toxicity can be selected to minimize the risk to aquatic organisms when using aquatic herbicides such as Rodeo®/Aquamaster®.

Further investigation into toxicity values for a variety of surfactants would enable weed control program managers to make surfactant decisions that would be most protective of the environment. ❖

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Natural Resources Self-Monitoring Guide Now Available for Landowners & Managers

The Yolo County Resource Conservation District (RCD) announces the availability of its newest publication geared toward farmers and other private landowners. "Monitoring on Your Farm" is a guide to tracking and understanding the resources and wildlife on one's land. The 100-page manual focuses on low-cost, low-tech equipment and easy methods that require minimal time input. Although the publication was written to be especially useful for private landowners, it may be of interest to a broad variety of other people.

Sections in the manual include:

Photomonitoring and record keeping;

Soil — infiltration testing and correct sampling for a professional soil analysis;

Water — estimating water flow in streams or ditches and checking sediment levels;

Plants – identification and survey techniques, including toe point counts and percent cover;

Animals – techniques for observing and tracking birds, mammals, reptiles, amphibians, and insects.

The manual includes field data sheets that are ready to be photocopied for immediate field use. "Monitoring on Your Farm" was produced in part with funds from the California Department of Conservation and the US Bureau of Reclamation.

Sample pages from the guide are available for viewing on the Yolo County RCD website at www.yolorcd.ca.gov/education. For more information or for copies of the manual (for purchase) contact the RCD at 530-662-2037, extension 119 or 221 West Court St., Ste. 1, Woodland, CA 95695.

Meet the New CALFED NIS Coordinators

Hello, I'm Erin Williams, the new CALFED Nonnative Invasive Species (NIS) Program Coordinator. The CALFED NIS program continues to be coordinated by the U.S. Fish and Wildlife Service office in Stockton and also has a new watershed coordinator (see below) who works directly with watershed groups to coordinate NIS activities on the ground. CALFED funded NIS projects include species such as invasive spartina, purple loosestrife, arundo donax, zebra mussels, and Asian clam. Additional projects include outreach/education to industries involved in importation or transportation of nonnative species, ballast water, and the creation of a restoration guidebook. The CALFED NIS Program has formed an interagency Nonnative Invasive Species Advisory Council (NISAC) that works on improving agency responses to NIS issues, especially prevention and rapid response. Initially, this Council will be working with CALFED proponents to assist with development of a rapid response model for zebra mussels. The Plant Health and Pest Prevention Services at the California Department

Continued on Pg 15...

New CALFED Nonnative Invasive Species Watershed Coordinator

I'm Roger Buttermore, the new CALFED Nonnative Invasive Species (NIS) Watershed Coordinator in the Stockton Fish and Wildlife Service office. My geographic scope is the habitats of the San Francisco Bay-Delta and its watersheds. One of my assignments is to link the various groups in the area by compiling a database of their contact and descriptive information, NIS impacts, needs and projects for eventual posting to the CALFED web site. To get a better idea of the individual challenges faced by each group, I aim to communicate with each watershed in the area over the next few months.

Another of my tasks is to develop and maintain a reference collection of aquatic NIS, and a list of taxonomic experts for each major group. This will speed up the process of identification and documentation of invasions as they are discovered. The collection will be made available to provide assistance with questionable taxonomic identifications. I was Senior Curator, Invertebrate Zoology at the Tasmanian Museum & Art Gallery for ten years, and also worked in the Tasmanian Herbarium, so I can't wait to get started on this project! Please contact me at Roger_Buttermore@fws.gov or (209) 946-6400 ext. 337.

Coordinator Hired to write State Aquatic Invasive Species Management Plan

Holly Crosson was recently hired by the University of California at Davis as the coordinator for development of California's Aquatic Invasive Species (AIS) Management Plan (see accompanying article). The project is funded by the CA Department of Fish and Game. Prior to coming to California, Holly worked for the Vermont Agency of Natural Resources in the Aquatic Invasive Species Program for 17 years. Her responsibilities in that program included design, implementation and evaluation of aquatic plant control and spread prevention projects, statewide monitoring of invasive plant populations, research and control technology transfer for new biological control methods, administration of the aquatic nuisance control permit program, and development and implementation of public education and outreach projects relating to aquatic invasive species. If you have any questions about the development of the California AIS Management Plan, please contact Holly at (530) 752-3419 or at hacrosson@ucdavis.edu.

Development of California's Aquatic Invasive Species Management Plan Underway *By Holly Crosson*

The introduction of non-indigenous aquatic invasive species (AIS) into the marine and fresh waters of California threatens the economic, social, public health, and ecological integrity of the state's water resources. Since

natural population controls that keep AIS in check in their native habitats are absent in California, these invaders can spread rapidly, destroying native plant and animal communities, reducing recreational opportunities, lowering property values, and severely impacting irrigation, power generation, and other water-dependant industries. Many federal, state and local groups have long been involved in programs for AIS eradication, prevention and control in California. However, a sustained, consistently funded and more coordinated effort of local, state, and federal governments and private sector businesses and organizations is needed to address this serious issue now and in the future. While there are diverse interests involved statewide, there is a high degree of common purpose between the groups who value, enjoy, utilize, manage and protect marine and freshwater habitats threatened by AIS.

Having a comprehensive state plan for managing AIS in California will serve several purposes. The plan will identify AIS of concern and provide a framework for how to address their prevention, eradication and management. It will facilitate the coordination of AIS management, outreach and research activities throughout the state. The plan may also provide funding opportunities from the national Aquatic Nuisance Species Task Force.

In August of 2002, representatives of 14 agencies came together to participate in a State AIS Planning Workshop. Results of that meeting included a draft set of goals and objectives for an AIS Plan, an assessment of opportunities and impediments to creating a plan, a draft task list, and a summary of current activities for each participating agency with a role in managing AIS in California. In October of 2002, with funds provided by the CA Department of Fish and Game, a part-time plan coordinator was hired to write the California AIS Management Plan. The work is being done through a contract with the University of California at Davis in the Department of Environmental Science and Policy. In accordance with recently passed state legislation, the first working version of the plan must be submitted to the legislature by January 1, 2004.

Incorporating recommendations from stakeholders can contribute to a better and more responsive AIS plan for the State of California. In an effort to get input on their concerns and perspectives regarding AIS during the plan's development, meetings are being held to get input from groups in the pet, aquarium, and nursery/landscaping trades, live bait and seafood dealers, ports, shippers and marinas, boaters, anglers, irrigation districts, tribes, and other interested parties.

The first stakeholder meeting was held in Sacramento on November 19, 2002. Invitations were sent to over 200 individuals in northern California, though only 20 people attended the meeting. A southern California stakeholder meeting will take place in San Diego early in 2003.

Most comments pertained to AIS education and outreach, spread prevention, regulation and enforcement, and general suggestions for AIS Management Plan *continued on page 15...*

Developing alternatives to invasive Landscape and garden plants

By Alison E. Stanton

A significant proportion of intentionally introduced ornamental plants have become a serious threat to wildland biodiversity and ecosystem processes because a good ornamental plant may have traits that can also make it a good weed. Horticulturists want plants that are easy to propagate, establish rapidly, mature early, produce abundant flowers, and are environmentally fit and free from major insect and disease pests. The perfect weed has many of the same characteristics: broad germination requirements, early maturity, fast growth, prolific seed production, and few natural predators. Collectively, these traits increase the ability of a plant to survive without human assistance and become established in the wild.

Providing alternatives to invasive ornamentals is an easy and effective way to enable nursery industry members, commercial users, and the gardening public to select the "right plant for the job," while minimizing the risks of garden escapes. A project is underway to develop a list of currently available ornamental plants that invade natural areas and should not be sold in nurseries in California. The list matches an ornamental invader with non-invasive native and non-native plants that share similar horticultural characteristics.

On June 7th, 2002, a group of weed ecologists and horticultural specialists met at the UC Botanical Garden at Berkeley to discuss the problem of invasive ornamental plants. All participants recognized that horticultural stock is a significant source of known and potentially invasive plants.

First, attendees selected a target group of plants that were available in nurseries and had realized or potential impacts in natural areas. We wanted to avoid plants with a CDFA noxious weed rating except in instances where they were still available in the trade. Three breakout groups each identified 10 – 12 plants that they did not want to see in nurseries based upon these criteria. Next, we assimilated the three lists to produce a top list of horticultural invaders. In a second breakout session, we focused on why these plants might be planted in the landscape in the first place. Taking a criteria-based approach, we came up with the horticultural attributes of the target invaders- hardiness, growth habitat, care requirements, flowering time, color, foliage type, or how the plant would fit into different landscape design ideas. Each group then identified a list of potential alternatives that matched one or more of the horticultural attributes.

We had a second follow-up meeting at the garden on the afternoon of November 20th where we made the decision to formally focus our list primarily on suitable alternatives to the problem invaders of the north-central coast in California. We divided the target plants into functional groups (i.e. ground cover, or ornamental grass) in order to streamline our efforts to list alternative species. This resulted in the addition of several invasive trees and the removal of one plant from the list that is primarily distributed in seed packets. See Table for the current draft list of target ornamentals.

The final product of these meetings, scheduled for publication in early spring 2003, will be a color brochure listing the problem ornamental invaders by functional group next to suitable alternatives that fulfill one or more specific horticultural attributes. Plans to distribute the brochures through the Master Gardener program, UC Cooperative Extension, and Weed Management Areas are underway. The project has been made possible by a grant from Environmental Defense, with additional funding and services provided by the UC Botanical Garden at Berkeley, the California Exotic Pest Plant Council, and the Santa Clara County Weed Management Area. For more information please contact Alison Stanton at travertine@earthlink.net. ❖

Scientific Name	Common Name
Dry Ground Cover	
*Cotoneaster microphylus**	Rockspray cotoneaster
*Hedera helix**	English Ivy
Vinca major	Vinca
Carpobrotus edulis	Ice plant
*Helichrysum petiolare**	Licorice plant
Ornamental Grasses	
*Pennisetum setaceum**	Fountain grass
Stipa tenuissima	Mexican feather grass
*Cortaderia selloana**	Pampas grass
Flowering Shrubs	
Genista monspessulana	French broom
*Cytisus scoparius**	Scotch broom
*Spartium junceum**	Spanish broom
Sesbania punicea	Scarlet wisteria
Large Shrubs	
*Cotoneaster lacteus**	Parney's red clusterberry
Trees	
Eucalyptus globulus	Blue gum eucalyptus
Acacia melanoxylon	Blackwood acacia
*Robinia pseudoacacia**	Black locust
Sapium sebiferum	Chinese tallow tree
*Schinus molle**	California peppertree
*S. terebinthifolius**	Brazilian peppertree
Eleagnus angustifolia	Russian olive
Myoporum laetum	Mousehole tree

Range and Pasture Transline Herbicides Unaffected by Recent Changes ...Proper Stewardship Helps Ensure Future Availability *By Bryan L. Stuart*

Range and pasture users of Transline herbicide remain largely unaffected by legislation last year in California related to herbicides in compost, but recent residue-in-compost controversies underline the need to read — and heed — label precautions. While early versions of the California bill had potentially broad implications for herbicide users in general, the final legislation focused only on lawn and turf applications for clopyralid.

Clopyralid, the active ingredient in Transline, is a critical tool for controlling yellow starthistle and other hard-to-control weeds. It is also a common ingredient in herbicides used in urban lawn and turf environments and on golf courses, at lower rates and with fewer applications than many alternatives.

Clopyralid products have been on the market in the U.S. for more than 15 years. They have a narrow spectrum of activity, primarily legumes (e.g. clover, but also peas and beans), composites (e.g. thistles, but also sunflowers) and solanaceae (e.g., nightshade, but also tomato and potato). These products have a favorable human health and environmental profile, break down readily in the natural environment and have been described by regulators as "a low-toxicity chemical that poses little hazard to people, animals and most vegetation."

No reports of plant damage related to clopyralid residues in compost have arisen in California. AB 2356 was introduced by Assemblymember Fred Keeley during the 2002 session based on concerns originally raised in Washington State.

In Spokane, high use of clopyralid on lawns coupled with an aggressive grass recycling, curbside pickup program resulted in part per billion level detections of the herbicide in compost, with several reports of injured plants following use of the affected material. In some instances, the compost was used without following the widely accepted and recommended practice of blending it with soil or other organic media.

As a result of recent controversies, the California Department of Pesticide Regulation (DPR) initiated cancellation of clopyralid's residential lawn uses. Additionally, in conjunction with the California Integrated Waste Management Board, DPR has convened stakeholder meetings to gather information on the significance of other clopyralid uses to compost.

Recent changes in clopyralid use include the following:

· Dow AgroSciences, in cooperation with U.S. EPA, will be discontinuing U.S. residential uses of clopyralid. The company has also initiated a more aggressive outreach and stewardship effort for all uses potentially related to compost, reiterating label warnings and restrictions.

Continued on Pg 15...

Introducing the California Weed Science Society

By Robert Levitt

The California Weed Science Society is now entering its 55th Year in existence since the first annual conference was held in 1948. The 55th CWSS Annual Conference was held this year from January 20-22 in Santa Barbara. The CWSS is the oldest society of its kind in the United States, predating even the Weed Science Society of America. Though the Society began with only about a dozen members, the CWSS now has 1300 members from the entire range of weed science and vegetation management, including members from government agencies, universities, private industry, growers, commercial and private applicators and others.

Pam Geisel, the new President of the Society, recently took over leadership from Bruce Kidd at this year's Conference. Pam works for the UC Cooperate Extension in Fresno County. CWSS emphasizes that membership is open to everyone interested in weeds, no PhD required. The California Weed Science Society is funded entirely through conference fees and its publications, which include *Principles of Weed Science,* now in its third edition, and a yearly weed calendar. Both are available through Thompson Publications.

Besides hosting the Annual Conference, CWSS gives an award to students who present papers at the conference as either a poster or oral presentation. Three awards are given in each category. CWSS had also supported the publication of *Aquatic and Riparian Weeds* by Joe D. Tomaso. The CWSS Annual Conference is also a great way to accumulate 17.5 hours of continuing education credit, including 6.25 hours of the hard-to-get "Laws and Regulations" credits. If you missed this year's Conference, mark your calendars for Jan 12-14, 2004 for the next conference to be held in Sacramento. The Conference is usually attended by 800-1000 participants.

The CWSS is a dynamic and exciting organization, and would like for you to be a part. ❖

Video Resources for Weed Managers

Hate weeds? Love movies? We're here to help. Here at the Noxious Times we've compiled a list of a few videos that offer information for training and public education. They may not be oscar material, but chances are you'll find at least one that's useful.

Good Horsekeeping: Managing Manure to Protect the Environment. Produced in Connecticut, ~15 Minutes. For a copy, contact NRCS National Employee Development Center, PO Box 6567, Fort Worth, Texas 76115. Telephone (817) 509-3247, Fax (817) 509-3217.

Stop Exotics: Clean your boat. Features John Ratzenberber, a.k.a Cliff from Cheers. Shows boaters how to clean their boats to prevent spread of invasive species. Produced in Minnesota, ~11 Minutes. For more info contact: Minnesota Sea Grant, 2305 E 5 St., Duluth, Minnesota 55812. (218) 726-8106, seagr@d.umn.edu

Yellow Starthistle: Managing An Invasive Alien Species. Includes information on background and biology, control methods, and the future of YST control. Produced by Xenobiota Xposures, ~50 minutes, $20. For ordering info, www.xenob.com

A Kids Journey To Understanding Weeds WWPC: From Wyoming Cooperative Extension, PO Box 3354, Laramie, WY 82071-3354. (307) 766-2115, http://www.uwyo.edu/ces/pubs2.htm.

Enhancing Resources Through Integrated Weed Management Systems: From Wyoming Cooperative Extension, PO Box 3354, Laramie, WY 82071-3354. (307) 766-2115, http://www.uwyo.edu/ces/pubs2.htm.

Aquatic Plant Control Research Program: Chemical Control Technology: US Army Corps of Engineers, Waterways Experiment Station, 3909 Halls Ferry Road, Vicksburg, MS 39180. ~10 Minutes

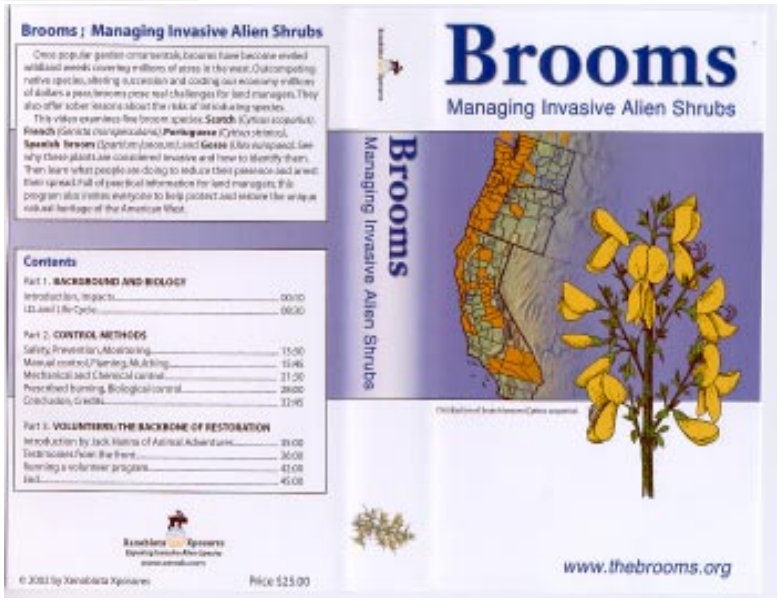
Aquatic Plant Control Research Program: Ecology of Submersed Aquatic Macrophytes: US Army Corps of Engineers, Waterways Experiment Station, 3909 Halls Ferry Road, Vicksburg, MS 39180. ~10 Minutes

Preserving our Western Landscapes: A Cooperative Approach to Noxious Weed Management. ~16 Minutes. For More information contact Steve Brill at the Goshen County Weed and Pest Control District @gocoweed@prairieweb.com or PO Box 757, Torrington, WY 82240

Pampas Grass: Managing An Invasive Alien Species. Includes information on background and bioliogy, various control methods with real control project examples . Produced by Xenobiota Xposures, ~22 minutes, $20. For ordering info, www.xenob.com

New Broom Video!!!

Brooms: Managing Invasive Alien Shrubs. Includes information on background and biology of Scotch, French, Portuguese, Spanish brooms and Gorse, control methods, and volunteer programs. Produced by Xenobiota Xposures, ~45 minutes, $25. For ordering info, www.xenob.com



Biological Control: Learning to Live with the Natural Order: Produced by USDA Animal and Plant Health Inspection Service, Plant Protection Quarantine. National Biocontrol Institute USDA-APHIS, PPQ-CPHST, 4700 River Rd, Unit 5, Ste. 1C16, Riverdale, MD 20737-1229. Phone: 301-734-7823 http://www.aphis.usda.gov/ppq/nbci/nbcistor.html

For a more complete list of videos and other resources available, see the following web site: http://www2.montana.edu/weedcenter/catalogqueryform.html ❖

...SB 1573, continued from page 3

council assures that information will be more reliable and consistent.

The Director of the DFG, or his or her representative, will chair the council. Members of the Council will be representatives from the following agencies:

A. Dept of Food and Agriculture
B. Dept of Boating and Waterways
C. Dept of Parks and Recreation
D. Department of Water Resources
E. State Water Resources Control Board
F. California Coastal Commission
G. State Coastal Conservancy
H. University of California
I. State Lands Commission

The governor may appoint to the Council, as public representatives, persons with expertise in aquatic invasive species representing each of the following interest groups: ports or shipping, or both; business interests; environmental interests; and, local water agencies. Members of the Council may invite representatives of federal agencies and tribal groups to join the Council as members.

The DFG, in cooperation with the Council, will use existing funds and current personnel of DFG, to support and coordinate the development of a comprehensive plan for dealing with aquatic invasive species. The plan will address prevention, including education of the general public and policymakers, monitoring and detection, control and eradication, inspection, and enforcement. To the extent possible, the plan will follow the guidelines of the federal Aquatic Nuisance Species Task Force.

The Council to meet at least twice annually to ensure that state agency activities are coordinated, complementary, cost-efficient, and effective. The bill will go into effect January 1, 2003, and the Council will submit its first working version of the plan to the Legislature on or before January 1, 2004. ❖

...Aquatics, continued from page 11

development. Attendees clearly felt that AIS education and outreach should be a top priority. Target audiences should include not only the above-mentioned interests, but everyone, including children in K-12 classrooms. Another message that needs to be conveyed is what are the consequences of invasion, particularly the economic costs.

Many stakeholders feel that AIS prevention, both into and out of California, is critical and the most cost-effective strategy. Early detection and rapid response are the keys to success and these types of efforts need to be given priority funding.

Concerns regarding current and future legislation and regulations were commonly voiced. Some felt that a concerted effort is needed to make the laws, regulations and permits that deal with AIS more clear, consistent and effective. It was also suggested that steps be taken to provide the public more opportunity for input when new laws and regulations are being written. Once new laws are passed, the public needs to be made aware of them before they go into effect.

There will be plenty of opportunity for comment on the California Aquatic Invasive Species Management Plan as it develops. A three-page summary of the Northern California Stakeholder meeting is available to anyone who would like more details about the discussions. If you would like to receive an invitation to the Southern California Stakeholder meeting being held in San Diego early in 2003, contact Holly Crosson (AIS Management Plan Coordinator) at (530) 752-3419 or at hacrosson@ucdavis.edu. ❖

...Williams, continued from page 10

of Food and Agriculture recently completed a "Model Rapid Response Plan " for the Western Regional Panel of the Aquatic Nuisance Species Task Force. This plan will be a great starting point for the zebra mussel rapid response plan. Don't forget about the CALFED Science Conference which will be held on January 14-16 at the Sacramento Convention Center. The program and registration information can be found on the web at http://www.iep.water.ca.gov/calfed/sciconf/2003/. Feel free to contact me at Erin_Williams@fws.gov or (209) 946-6400 ext. 321. ❖

...Transline, continued from page 13

- In California, AB 2356 requires: 1) only licensed dealers are authorized to sell clopyralid products, 2) only certified applicators are allowed to buy clopyralid products labeled for lawn and turf use, and 3) DPR must make additional decisions on lawn and turf products by April 1, 2003.

None of the changes directly affect the use of Transline on range and pasture. However, users should note that existing labels contain important restrictions relevant to the compost issue because clopyralid is not retained by livestock, being largely passed through in urine unchanged.

Label provisions protecting against the potential for residues in compost include:

- Transfer restrictions to prevent movement of grazing animals from treated areas to sensitive broadleaf crops without first providing seven days on untreated pasture; and
- Restrictions for the protection of sensitive plants on the use of compost or mulch containing hay or straw from treated areas or manure from animals that have consumed treated forage.

The good news is that the benefits of clopyralid for the control of noxious and invasive weeds are widely recognized as critical in the protection of our natural resources. Proper use and stewardship of Transline will help ensure its continued availability in years ahead.

For more information on this issue, see www.clopyralid.com. ❖

Bryan L. Stuart, Ph.D. Government Relations Manager, Western U.S.

Upcoming Events:

Invasive Plants in Natural and Managed Systems: Linking Science and Management.
A Conference and Workshop in conjunction with 7th International Conference on the Ecology and Management of Alien Plant Invasions. November 3-7, 2003. Wyndham Bonaventure Resort, Ft. Lauderdale, FL. For more information see the attached flier or visit http://www.esa.org/ipinams-emapi7/. If you are interested in participating in the Conference and would like
to be added to the mailing list to receive updates, please email your name and contact information to ipinams@esa.org.

Weed Science Society of America Annual Meeting, February 24-28, 2003, Adams Mark, Jacksonville, FL. Contact: jlancaster@allenpress.com or www.wssa.net

NIWAW IV...the National Invasive Wees Awareness Week in Washington DC will take place February 24-28, 2003. Contact: North American Weed Management Association, www.nawma.org/index

7th International Conference on Ecology and Managemnet of Alien Plant Invasions (EMAPI), November 3-8, 2003, Miami, FL. Contact: www.bio.miami.edu.iiirm.emapi7

CDFA Hydrilla Program Review Meeting, February 19, 2003. Plant Diagnostic Lab, 3288 Meadowview Road, Sacramento. Contact: Robert Leavitt, rleavitt@cdfa.ca.gov.

Western Aquatic Plant Management Society, 22nd Annual Meeting, March 4th and 5th 2003. Red Lion Inn, 1401 Arden Way, Sacramento CA. Contact: www.wapms.org/conference

Spring Flora & Ecology of the Sedgwick Reserve Weekend Workshop (Santa Barbara County) March 21-23 and **Spring Flora of the Eastern Mojave Desert Weekend Workshop** (UC Granite Mountain Desert Research Center) April 17-20. Contact: ucjeps.berkeley.edu/jepwkshp.

Advertize your upcoming events. Notify us at noxtimes@cdfa.ca.gov

California Interagency
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